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EXAMINER	
NGUYEN, LUONG TRUNG	

ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/801,204	TAN ET AL.	
	Examiner	Art Unit	
	LUONG T. NGUYEN	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I (Figure 3) and Figure 2A, which read on claims 1, 2, 6-9, 11, 13-16 and 18-21 in the reply filed on 7/11/2007 is acknowledged.

In the Amendment filed on 12/25/2007, the Applicants amended claim 10 to make claim 10 readable on Species I (Figure 3). Therefore, claims 1-21 are examined in this current Office action as follow.

Response to Arguments

2. Applicant's arguments filed on 12/25/2007 have been fully considered but they are not persuasive.

In re page 15, Applicants argue that "there is no discussion, hint at or suggestion of subtracting dark voltages from color signals where such dark voltages are based on measurements obtained at an ambient temperature at which a color sensing circuit is operating. Likewise, there is no discussion, hint at or suggestion regarding fluctuations or variations of dark voltages with temperature, or compensating color signals for such fluctuations or variations."

In response, noted that the feature "fluctuations or variations of dark voltages with temperature, or compensating color signals for such fluctuations or variations" is not claimed. Instead, regarding claim 1, Applicants amended claim 1 with limitations "a color sensor circuit … corresponding to an intensity of said color component occurring at a current ambient temperature;" "a differential amplifier circuit operably coupled to said color sensor circuit and to said dark color sensor circuit, said differential amplifier circuit being configured to receive said

first and second output voltages, remove, using said second output voltage, said dark color offset voltage from said first output voltage, and thereby provide a dark color offset voltage and ambient temperature compensated output signal to a differential output thereof representative of said intensity of said color component."

The Examiner considers that Sonoda et al. does disclose "a color sensor circuit … corresponding to an intensity of said color component occurring at a current ambient temperature." Sonoda et al. discloses output voltages corresponding to color signals R, G, B are outputted from image sensor 1 via amplifiers 2, 3, 4, which occurs at a temperature of surrounding area or environment such as a room temperature (a current ambient temperature), figure 7, column 1, lines 10-67.

It should be noted that the specification page 12, paragraph [0039] only discloses in Figures 2A that compensates for the dark current voltage offset, there is no disclosure support for limitation "provide a dark color offset voltage and ambient temperature compensated output signal"; therefore the amended limitation "… provide a dark color offset voltage and ambient temperature compensated output signal to a differential output thereof representative of said intensity of said color component" does not have support in the specification, claim 1 and claims 9 , 16 which are amended with similar above limitation, are rejected under 112, 1st paragraph. For examination, this limitation will be interpreted as "provide a dark color offset voltage compensated output signal to a differential output thereof representative of said intensity of said color component." And Sonoda et al. discloses this limitation. Sonoda et al. discloses a signal available on subtraction of the dark voltage form the R signal is outputted from amplification circuit 8, figures 7, 10, column 1, lines 10-67 (corresponds to provide a dark color offset voltage

compensated output signal to a differential output thereof representative of said intensity of said color component).

In re page 19, Applicants argue that "there is no discussion, hint at or suggestion in Nagasaki or Nelson references regarding subtracting dark voltages from color signals where such dark voltages are based on measurements obtained at an ambient temperature at which a color sensing circuit is operating. Likewise, there is no discussion, hint at or suggestion regarding fluctuations or variations of dark voltages with temperature, or compensating color signals for such fluctuations or variations."

In response, see Examiner's comments regarding this feature as discussed above.

In re pages 20-21, Applicants argue that there is no teaching or suggestion in Sonoda, Nagasaki or Nelson references to produce the invention recited in claims 1 through 21.

It should be noted that claims 1, 4, 6-9, 13-16, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al. Claims 2-3, 11-12, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. in view of Nagasaki et al. further in view of Nelson et al.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Claim Objections

3. Claims 1-15 are objected to because of the following informalities:

Claim 1 (line 10), claim 9 (line 12), "said ambient temperature" should be changed to --said current ambient temperature--.

Claim 2 (line 1), claim 3 (line 1), claim 4 (line 1), claim 5 (line 1), claim 6 (line 1), claim 7 (line 1), claim 8 (line 1), claim 9 (line 1), claim 10 (line 1), claim 11 (line 1), claim 12 (line 1), claim 13 (line 1), claim 14 (line 1), claim 15 (line 1), "The color sensing circuit" should be changed to --The dark color ambient temperature compensated color sensing circuit--.

Claim 1 (line 14), "a feedback resistor" should be changed to --the feedback resistor--.

Claim 9 (line 11), "a offset voltage" should be changed to --an offset voltage--.

Claims 2-8 are objected as being dependent on claim 1.

Claims 10-15 are objected as being dependent on claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 1-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 1, the Applicants amended claim 1 with limitation "provide a dark color offset voltage and ambient temperature compensated output signal;" Regarding claim 9, the Applicants amended claim 9 with limitation "provide a dark color offset voltage and ambient temperature compensated output signals;" Regarding claim 16, the Applicants amended claim 16 with limitation "provide a dark color offset voltage and ambient temperature compensated first output signal;" Regarding claim 18, the Applicants amended claim 18 with limitation "provide dark color offset voltage and ambient temperature compensated first and second output signals." There is no disclosure support for these limitations in the specification as originally filed, since the specification page 12, paragraph [0039] only discloses in Figures 2A that compensates for the dark current voltage offset, there is no disclosure of "provide ambient temperature compensated output signal".

Claims 2-8 are rejected as being dependent on claim 1.

Claims 10-15 are rejected as being dependent on claim 9.

Claims 17-21 are rejected as being dependent on claim 16.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 4, 6-10, 13-16, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al. (US 5,329,111).

Regarding claim 1, Sonoda et al. discloses a dark color ambient temperature compensated color sensing circuit, comprising:

a color sensor circuit configured to provide a light photocurrent from a color component of a light input, said color sensor circuit being configured to provide a first output voltage corresponding to an intensity of said color component occurring at a current ambient temperature (Sonoda et al. discloses output voltages corresponding to color signals R, G, B are outputted from image sensor 1 via amplifiers 2, 3, 4, and entered differential amplification circuits 8, 9,10 via resistors 8d, 9d, 10d; which occurs at a temperature of surrounding area or environment such as a room temperature (a current ambient temperature), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current ambient temperature (noted that an output voltage which represents the color temperature of a light source is depend upon ambient temperature) and output a second output voltage corresponding to an offset voltage generated by said dark photocurrent at said current ambient temperature (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

a differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said color sensor circuit and to said dark color sensor circuit, said differential amplifier circuit being configured to receive said first and second output

voltages, remove, using said second output voltage, said dark color offset voltage from said first output voltage, and thereby provide a dark color offset voltage and ambient temperature compensated output signal to a differential output thereof representative of said intensity of said color component.

Regarding claims 4, 10, Sonoda et al. discloses wherein said differential amplifier circuit comprises:

a difference amplifier (differential amplifier 8a, figure 7, column 1, lines 10-67) configured to provide said compensated output signal to said differential output and further comprising a positive input, and a negative input;

a feedback resistor (resistor 8b, figure 7, column 1, lines 47-67) having a resistor value with one end coupled to said negative input and another end coupled to said differential output;

a first resistor (resistor 8d, figure 7) having said resistor value coupled in series with a color sensor output configured to provide said first output voltage and said negative input;

a second resistor (resistor 8c, figure 7) having said resistor value coupled in series with a dark sensor output of said dark sensor circuit configured to provide said second output voltage and said positive voltage;

a third resistor (resistor 8e, figure 7) having said resistor value coupled in series to said positive input and to ground.

Regarding claims 6, 13, 19, Sonoda et al. discloses wherein said color component comprises red (figures 6-7, column 1, lines 10-67).

Regarding claims 7, 14, 20, Sonoda et al. discloses wherein said color component comprises green (figures 6-7, column 1, lines 10-67).

Regarding claims 8, 15, 21, Sonoda et al. discloses wherein said color component comprises blue (figures 6-7, column 1, lines 10-67).

Regarding claim 9, Sonoda et al. discloses a dark color ambient temperature compensated color sensing circuit comprising:

a plurality of color sensor circuits, each color sensor circuit being configured to provide a light photocurrent from a color component of light input corresponding thereto, and to output a first output voltage corresponding to an intensity of said color component corresponding thereto that occurs at a current ambient temperature (voltage indicating intensity of R color signal outputted from amplifier 2 and entered differential amplification circuit 8; voltage indicating intensity of G color signal outputted from amplifier 3 and entered differential amplification circuit 9; voltage indicating intensity of B color signal outputted from amplifier 4 and entered differential amplification circuit 10; the image sensor 1 output these output voltages at a

temperature of surrounding area or environment such as a room temperature (a current ambient temperature), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current ambient temperature (noted that an output voltage which represents the color temperature of a light source is depend upon ambient temperature) and output a second voltage corresponding to an offset voltage generated by said dark photocurrent at said current ambient temperature (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

at least one differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said plurality of color sensor circuits and to said dark color sensor circuit and being configured to receive said first and second output voltages, remove, using said second output voltage, said dark color offset voltage from each of said first output voltages, and provide dark color offset voltage and ambient temperature compensated output signals corresponding to each of said color components to at least one differential output thereof, each of said output signals representing said intensity of said color component corresponding thereto.

As for claim 16, claim 16 is a method claim of apparatus claim 1. Therefore, see Examiner's comments regarding claim 1.

As for claim 18, claim 18 is a method claim of apparatus claim 9. Therefore, see Examiner's comments regarding claim 9.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2-3, 11-12, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111) in view of Nagasaki et al. (US 5,502,488) further in view of Nelson et al. (US 5,508,507).

Regarding claims 2-3, 11-12, Sonoda et al. fails to specifically discloses a sensor circuit comprises:

a transimpedance amplifier including an output configured to provide said first output voltage, a negative input, and a positive input;

a feedback resistor with one end coupled to said output and another end coupled to said negative input;

a photodetector configured to detect said photocurrent of said color component and comprising a photodetector input coupled to ground and to said positive input, and a photodetector output coupled to said negative input.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However, Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

Regarding claim 17, Sonoda et al. fails to discloses matching a resistor value for resistors in a differential amplifier circuit, to a resistance of a feedback resistor in a color sensor circuit configured to measure said first voltage, wherein said differential amplifier circuit is configured to receive said first voltage and said offset voltage and outputs said final voltage.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However, Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Noted that figure 3 shows a matching a resistor value of feedback resistor 54 to resistance of compensator capacitor 56. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111).

Regarding claim 5, Sonoda et al. fails to specifically disclose wherein said resistor value approximates a resistance of a feedback resistor in said color sensor circuit. However, Official Notice is taken that it is well known in the art to set the resistor value of a feedback resistor in a

differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal stable. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by setting the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal be stable.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David L. Ometz/
Supervisory Patent Examiner, Art Unit 2622

/L.T.N/
3/16/08